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Fur resources of the  
United States

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# FUR RESOURCES OF THE UNITED STATES

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Box 312





FUR RESOURCES  
OF THE  
UNITED STATES

A SPECIAL REPORT

TO SUPPLEMENT  
THE EXHIBIT  
OF THE

UNITED STATES  
GOVERNMENT

AT THE

INTERNATIONAL  
FUR-TRADE EXPOSITION

LEIPZIG, GERMANY  
1930



UNITED STATES GOVERNMENT PRINTING OFFICE  
WASHINGTON

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## FOREWORD

By ARTHUR M. HYDE, Secretary of Agriculture, and  
ROBERT P. LAMONT, Secretary of Commerce,  
of the United States of America

THE QUEST for furs has always appealed to pioneers. The fur trader in the course of his work experiences all the hardships and risks all the dangers of the explorer and the early pioneer. He is an adventurer to-day as he was in past centuries. He stakes his life against the hazards of his calling, not only for the chance of profit but also for the love of adventure. Such hard, rugged life appeals to adventurous spirits. The fur buyer does have a chance to get back to the marts of trade from time to time, but the trapper seldom gets nearer than the outposts of civilization or the small towns of the remote hinterland.

So long as the primeval forests remained and the marshes were left in their natural condition and the streams flowed unpolluted, the trappers' activities gave no reason for concern for the future of the wild stocks, for the fur bearers were sufficiently prolific for the natural increase to meet an ever-growing demand. But with the encroachment of civilization and the destruction of forests, indiscriminate drainage of swamp land and lakes, and increasing pollution of streams—all reducing the natural fur-producing areas—the numbers of some species were gradually reduced below the point where their trapping was commercially profitable. These unfavorable conditions were made even worse by the fact that trappers were plying their trade out of season and the State trapping laws in many instances were inadequate.

In addition, in fur-conservation measures we are confronted with the problem of relative values of the fur animals and the birds or animals upon which they prey, or, as in the case of the beaver, we must compare the value of the pelt with the damage the animal does to lumber interests and farm property. These factors play an important part in reducing the number of fur bearers in States where the weight of evidence decides the question against the animals.

The United States, including the Territory of Alaska, has been producing approximately \$70,000,000 worth of pelts annually for several years past. This production is greater than Canada's annual \$18,000,000 and Soviet Russia's \$35,000,000 catch com-

bined. There are various reasons for the United States appearing as so large a producer. For example, the valley of the great Mississippi River is, as it always has been, an ideal section for wild life, with ample cover, an unfailing supply of water, and plenty of food. Some of the fur bearers, such as the skunk and the muskrat, are found there in extremely large numbers. Louisiana alone produces 4,000,000 to 6,000,000 muskrat pelts a year and under her judicious administration of her fur resources may reasonably expect to have an increased production in the course of time. The catch of muskrats in the United States is from 14,000,000 to 17,000,000 annually.

Although trapping has been carried on throughout the entire Mississippi Basin for several generations, and in some parts of it for more than 200 years, the smaller fur bearers have been able to hold their own chiefly by reason of their fecundity, but also from the fact that their larger natural enemies have been for the most part exterminated in the region.

Another reason for the great annual catch of American furs is that there are more trappers here than in many other countries. The population of the United States is greater per square mile than in Canada or in Siberia, and the trappers are well equipped for their work in woods and waters.

In addition to this great production, the United States imports furs and skins from about 80 countries. Furs are ninth on the list of the imports of the country, according to value, and twentieth on the list of exports. This country also consumes more fur than any other in the world. The total value of imports of raw and dressed furs and of manufactures from furs for 1924 was \$87,000,000; for 1925, \$115,000,000; for 1926, \$117,000,000; for 1927, \$135,000,000; for 1928, \$118,000,000; and for 1929, \$122,000,000.

These importations include about 20,000,000 pounds of rabbit skins alone, and as these run from six to seven skins to the pound, something more than 120,000,000 rabbit skins are imported into this country annually, besides those produced here. About half the total are made up into fur garments and the other half enter into the manufacture of felt hats.

Fur is thus seen to be an important commercial commodity. The fur industry employs many thousands, men and women who are making their living from furs and in turn are contributing to the comfort of great additional numbers of people. An industry the finished product of which is so much in demand scarcely needs apology for existence.

When the demand for a commodity exceeds the supply, production is promptly stimulated. The logical way to supply the demand for furs and at the same time prevent still further shrinkage in the source of supply is to produce more fur animals. The quickest and surest way to accomplish this in any country is through the enactment and strict enforcement of progressive laws for the protection of the fur bearers. This would not only have a beneficial effect on the quantity of fur produced but would greatly enhance its quality. A further means of increasing the production of fur and one of comparatively recent development is found in fur farming. This industry is surviving in very healthy condition the earlier work of promoters and now is established on a firm basis not only in North America but in many other parts of the world where suitable conditions are to be found.

Although the prospects for a continued supply of furs in the United States sufficient to meet the growing demands are not altogether promising, they are not entirely hopeless. If the public and private benefits from the fur resources of the Nation are to continue, there must be adequate legal protection for the source of supply. The diminution of fur animals in recent years has served to impress this fact upon all concerned. In this country this responsibility devolves for the most part upon the individual States rather than upon the Federal Government. Some progress is noted from year to year, though insufficient attention has thus far been given to scientific administration of the fur resources, and in a number of States the open seasons permit trapping at times when the fur of many species is not in prime condition.



## THE FUR SUPPLY AND FUR FARMING

By FRANK G. ASHBROOK, In Charge, Division of Fur Resources  
Bureau of Biological Survey, U. S. Department of  
Agriculture

### SOURCES OF THE FUR SUPPLY

**G**UARDING the source of the fur supply is as much a matter for public attention as is the preservation of any other natural resource. While the administration of forests, fish, and game in the United States may rest either with the States or with the Federal Government, the maintenance of a fur supply in



FIGURE 1.—Transporting furs by dog team is rapidly being replaced by more modern methods

the wild is dependent for the most part on the action of the various States. Both furriers and trappers should be especially concerned about the condition of native stocks, for it is upon a continuous raw-fur catch that their industry depends. (Figs. 1 and 2.)

The annual catch of fur bearers in the United States 25 years ago was estimated to be worth about \$25,000,000. To-day it is valued at \$70,000,000. In spite of this monetary showing, however, the fur resources are not being given proper attention nor fostered as they deserve. If one thing is more outstandingly evident than another in fur conservation, it is that if the supply had been

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maintained the present value of the Nation's fur catch to the trappers would be far in excess of \$70,000,000.

Those who have given only passing thought to the conditions surrounding fur-bearing animals in the wild are prone to blame trapping and trapping methods for the scarcity of the animals in certain sections of the country, forgetful of the reduction of their natural habitat by encroachments of industry and the inroads on the stocks through bounties offered in the interests of game protection and farming. It must be admitted that many trappers have been permitted to ply their trade out of prime season and to gather



FIGURE 2.—Eskimos of Siberia bartering skins with an American trader. Trading vessels start out every spring from Seattle, San Francisco, and Nome

pelts to the point of extermination of the fur bearers over large areas. At the same time, however, a serious responsibility rests on fur buyers and their agents who, by accepting at a price all skins offered and thus carrying to the markets illegal pelts, encourage thorough clean-ups along trap lines. Cooperation on the part of all concerned is necessary to insure perpetuation of the basic stocks of fur animals. Wasteful methods in trapping and in the fur trade should be prevented just as has been the indiscriminate felling of forests.

In recent years there has been a considerable development in fur farming as a means of increasing the supply of furs. Fox farming is an established industry to-day, and competent fox farmers are making money; some exceptionally competent ones are making a

great deal. Indeed, practically all the silver and black foxes used in the United States are farm raised. Muskrat farming, which is really not farming at all but merely regulated trapping on privately owned or leased marshes, is being widely and profitably engaged in. Rabbit farming for meat and pelts is well established in the West, especially in southern California. More than a million pounds of rabbit meat were produced and consumed in California in 1925, and the breeders are steadily extending their markets eastward. This, of course, means the production of a large quantity of furs as a by-product suitable for hatters' or furriers' use. Other animals, such as martens and minks, are being "farmed," but these undertakings are still in the experimental stage.

The pelts of sheep, goats, ponies, and other domestic animals also contribute to the fur supply. Indeed, they play an important part in the fur industry, as they form a considerable percentage of our fur imports in value and in bulk. Some are used for their own sake, as Persian lamb and karakul sheep, while others are used to imitate more expensive furs. A leopard may not change its spots, but leopard spots stenciled on a sheared goatskin make a striking and serviceable substitute for the more costly fur.

The production of low-priced skins to imitate those that are more expensive is not with the intent of fraud or deception, but for the purpose of placing furs within general reach and to supply the demands of all classes of our people. When only the wealthy wore furs there was use for only a limited variety of skins. As dressers and dyers find methods of handling new furs and skins their sphere of service is increased and fur products enter into a greatly enlarged field. As the field broadens increasing use is made of the skins of such domestic animals as sheep and goats, or more often of lambs and kids.

#### SAFEGUARDING THE SUPPLY

The earlier decrease in the supply of fur animals was noted in the quantity of the more valuable pelts reaching the markets, including marten, fisher, mink, and beaver, but now, under modern methods of trapping and improved means of transportation to the marts of trade (figs. 3 and 4), the decrease is affecting such staples as muskrat and raccoon.

The principal trends of the protective legislation that has been found necessary are toward shortening the trapping seasons, removing certain species from the trapping lists by extending or fixing close periods for definite or indefinite terms, and increasing trapping license fees. A salutary tendency to enlarge the powers of game wardens and commissions is more and more evidenced, in

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that they are permitted to make wild-life administrative programs sufficiently flexible to care for the fur resources under changing conditions. Protection in some States is just beginning to be afforded some fur animals. Species that have become scarce or have diminished in numbers need greater safeguards, and this should be extended to them either in the form of restricted trapping seasons or by closing seasons whenever necessary to allow opportunity for an increase.

We must look for the most part to the conservation of natural resources as our guaranty of an adequate future supply. The fur trade and the various State and national agencies interested in the natural resources are working toward this end. Waste of wild life



FIGURE 3.—American fur-trading schooner in the Arctic Ocean

will eventually be eliminated, and for it will be substituted intelligent conservation with use.

The enactment of suitable protective laws and their enforcement are made difficult from the fact that there is a lack of authentic information on the part of farmers, trappers, and members of the fur trade, of legislative committees, and even of conservationists. This frequently results in the fixing of open seasons that are too long, and even the close seasons that are established in some States do little to prevent the decrease of fur bearers in certain sections. A frequent defect in the present laws for fur protection is that the open season permits trapping before the pelts are prime in fall and after breeding is in progress in spring. That the present seasons are not wisely established in all cases is emphasized by the fact that far too many of the pelts coming to the raw-fur markets fall into the unprofitable class. A keener appreciation of conditions

learned from studying the habits, breeding seasons, and periods of prime fur of the various species by persons concerned with the framing of laws and regulations governing trapping would have the result of greatly increasing the quantity of pelts having fur of a superior quality that reach the markets. This would add to the financial rewards of trappers for their efforts and at the same time allow increased numbers of breeders to remain in the covers.

In certain States much of the misdirected activity for the suppression of so-called "vermin" of all sorts results from the desire to give better protection to game birds. The term "vermin" has been applied to those animals and birds that prey upon popular species of game. Such an attitude toward wild life in general has



FIGURE 4.—The airplane is being called into service for carrying furs from remote sections to railway centers

influenced some State legislatures to pass laws authorizing the killing of so-called "vermin" fur bearers at any time of year. Game-protective policies should always take into consideration the intrinsic value of fur as a natural resource.

#### BEGINNINGS AND PROGRESS OF FUR FARMING

When the dressing of furs became an established industry in the United States, it was discovered that many of the more valuable fur animals had almost disappeared from our forests and streams and that the northern Canadian Provinces were then the most important source of fine furs. It is true that the skunk, muskrat, opossum, and raccoon are left in considerable numbers in this country, particularly in the Mississippi Valley States, but the remnants of our once rich fur resources are fast dwindling under the conditions that have prevailed during the past century.

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With an increasing demand and an ever-decreasing supply of desirable pelts, a condition is being produced that is alarming and would be more so were it not for the demonstrated possibilities of producing fur animals in captivity. Fur farming is already on a substantial basis. It is destined, because of rapidly changing conditions, to have an even wider scope and to attract increased interest. Its future is assured, in that it affords the surest means of supplementing the diminishing production of furs in the wild.

During the past decade fur farming has shed its swaddling clothes and has grown to the point of representing an investment of more than \$50,000,000 in the United States alone. Already a husky juvenile giant, the industry promises to continue steadily in development. Furthermore, the old "tricks of the trade" for handling this new type of animal production have given way to standardized procedure. This means also that methods are not recommended or followed that are not the results of careful experimentation.

The early trappers and their Indian allies were the ones who took the first elemental steps in the fur-farming business. They continued to hunt and follow the trap line during the summer season, capturing fur animals alive and penning them until the pelts became prime with the approach of cold weather. Propagating fur animals entirely under the control of man is a direct outgrowth of this early Indian and pioneer trapper practice. The wonder is that back in the old days of the Hudson's Bay Co., when wild caught silver-fox pelts brought \$1,000 each, trappers did not turn farmers and produce these animals, at least to supplement their annual fur catch. But it sometimes requires a long time for the human race to discern the obvious, and the wild at that time seemed to be very well stocked.

The next step toward the development of fur farming was the digging of young fox pups out of their dens and raising them to maturity. The scarcity of black and silver fox pelts and the enormous prices paid for them led to the appreciation of existing opportunities for making such a practice profitable. Later a number of trappers and traders started breeding foxes in captivity to obtain silver strains. The discovery that the silver color in foxes is a Mendelian recessive to red, and that therefore a silver fox being of recessive color always breeds true, marked another important forward step. At first the operations of those who understood this principle of breeding were cloaked with secrecy. In the course of a few years, however, stories concerning the wealth to be obtained from the silver-fox business leaked out, and the fox-farming boom was on.

#### SPECIES EXPERIMENTED WITH

The greatest development to-day in raising fur animals under strictly controlled conditions is in the fox-farming industry. (Fig. 5.) In fox farming the animals are penned and fed and handled in every respect like ordinary domestic stock, except that they are given no chance to escape, for despite the fact that several generations of foxes have now been raised in captivity they are always alert to seize an opportunity to get back to the wild. Furthermore, they still retain a trait of savage wildness in their behavior. Foxes will bite viciously both their keepers and one another. Not only will one male fight another, but the animals sometimes resent having a mate selected for them. A male fox penned with a female will occasionally manifest his displeasure by murdering the proffered bride. At times, however, a male fox can be induced to become polygamous and mate with two or more



FIGURE 5.—Fox farming is a steadily developing industry in the United States. A well-arranged ranch in the mountains

females, though apparently many additional generations will have to live in captivity before Brother Fox will give up his wild traits and reconcile himself to the rôle of serving man as a humble and obedient domestic animal.

Muskrat farming, the next largest fur-raising development, has been carried on without any attempt to domesticate the animals in the ordinary sense of the word. The muskrats are neither housed nor fed. Sometimes an area of marshland is stocked without even inclosing it. The owner merely trusts the muskrat to recognize that its lines have fallen in pleasant places and not stray away. It has but few predatory enemies, and if conditions are right it will multiply and replenish the land. Of course, precautions must be taken to protect the enterprise from poachers.

The fox industry has now passed the speculative stage and the period during which the enterprise was kept alive through the



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sale of breeding stock, and both this and the muskrat industry are now on a profit basis from sale of pelts alone. It is yet a little early to predict the future of the karakul sheep-raising industry (fig. 6) and of that of raising some of the smaller fur bearers such as the mink and marten (fig. 7). It also has not been clearly demonstrated that the beaver, the raccoon, the skunk, and others, including the chinchilla (figs. 8 and 9), can be grown profitably in captivity when profits are based on the sale of pelts. Although the production of



FIGURE 6.—Karakul sheep flocks in the United States are increasing

breeding stock for sale may show alluring returns for a time, the final measure of success with any fur bearer will come from the profit or loss in the production of pelts destined for use by the furrier.

Europe as well as the United States is striving to develop a domesticated fur-animal industry, and American exportations to other countries of fur animals, including foxes, minks, muskrats, skunks, and raccoons, continue to increase. During the past year many shipments have been made to Norway, Sweden, Germany,

France, England, Czechoslovakia, and Russia. Fur farming was in operation in some of these countries prior to the World War, but since that time it has received increased attention. Large silver-fox

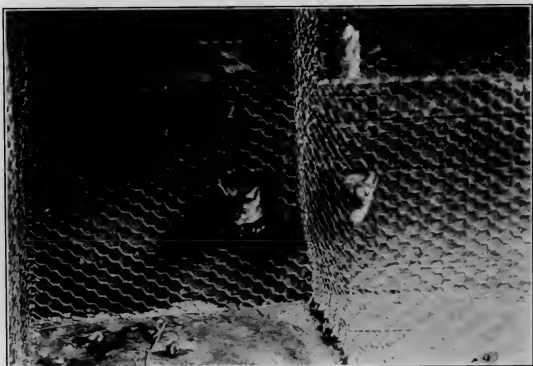


FIGURE 7.—Each of these martens lives in a separate pen



FIGURE 8.—Skunk raising has not yet proved to be profitable as a fur-production enterprise

farms have been established, and some European producers have begun to send fox pelts to the raw-fur markets.

#### HANDLING ANIMALS ON FUR FARMS

With few exceptions fur animals are largely carnivorous. Hearts and kidneys of cattle, horses, and hogs are fed freely. The livers are laxative and must be used sparingly. Fish, when it can

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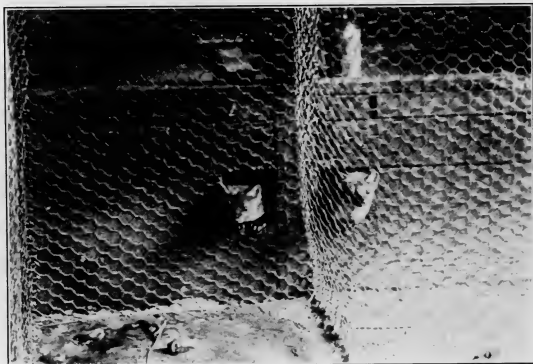


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be obtained fresh and in sufficient quantity, is an excellent feed. Such by-products as fish meal, dried blood, and edible tankage are being fed extensively. Cereals, vegetables, and fruits may be termed supplementary feeds and are fed to best advantage as such.

The most successful fur farmers give all the food in the raw state. This is not only better for the animals, but less expensive. The quantity to be supplied depends entirely on the season and on the age, appetite, and condition of the individual animal. One feeding a day is sufficient for mature animals during certain months of the year. Just before and during the breeding season they are fed



FIGURE 9.—A number of attempts are being made to raise chinchillas in captivity

fairly heavily so they will be in good, vigorous condition. Females suckling young and young that have been weaned are fed liberally.

Many of the failures in fur farming may be attributed to negligence on the part of the caretaker. Fur animals will not thrive under careless management, and a fur farmer who has no sustained interest in the welfare of his animals need not expect success. Progressive fur farmers handle their breeding stock in such manner as will insure the highest percentage of increase, and they are willing when necessary to spend all their time on the job.

Before one can handle fur animals intelligently he must know something concerning their behavior. He must study them at

every opportunity when performing his duties on the ranch. Fur animals are naturally active at night, but most of them are quiet during the day, remaining in the den or curled up on top of it, or in some shady, secluded spot. They are inquisitive, and their desire to see everything that is going on around them leads them to select advantageous positions for the purpose. Moving objects interest them keenly, and birds or mammals entering their pens fall quick prey to their alertness. As a rule they live peaceably together, but their treacherous dispositions become apparent when they can take a mate or a neighbor at a disadvantage.

Success in fur farming is directly dependent on careful breeding, feeding, and handling methods, but of equal importance is the matter of killing the animals properly and removing the pelts. The most successful producers recognize the fact that primeness is the highest quality of perfection in a pelt, and that when the pelt shows quality and finish, determined by its texture and skin, it is prime. Ability to judge primeness comes only with experience. When a fur is coming prime, it does so rapidly, and after it reaches the peak of perfection it soon becomes overprime, losing its sheen and finish. Experienced trappers and fur farmers remove the pelts just before they are prime rather than take the chance of delaying until they are overprime.

#### FOX FARMING

Fox farming (figs. 10 and 11) as carried out by trained and careful men has many remarkable successes to its credit. Needless to say, there have also been many failures. Gullible people have listened to flamboyant claims of high-pressure salesmen and have made large investments, only to own breeding stock of poor quality. Ignorance of handling methods and the gradual waning of enthusiasm have piled up further losses.

The history of the new industry, however, is also replete with brilliant and dramatic successes. One fact standing out clearly is that most of the money makers in fur farming learned the business before venturing into it heavily on their own account. The only place where the business can really be learned is on an actual fur farm. Case after case could be mentioned in which young men from both city and country have obtained employment on fox farms and after acquiring experience there have purchased breeding stock for themselves and made a success of their ventures. On one occasion two lads, after gaining practical experience, invested in a small way in silver foxes, and their first litter of four pups paid the initial cost and the expenses, leaving a little bank balance. The next year, of a litter of five pups produced, three were sold, and one pair was

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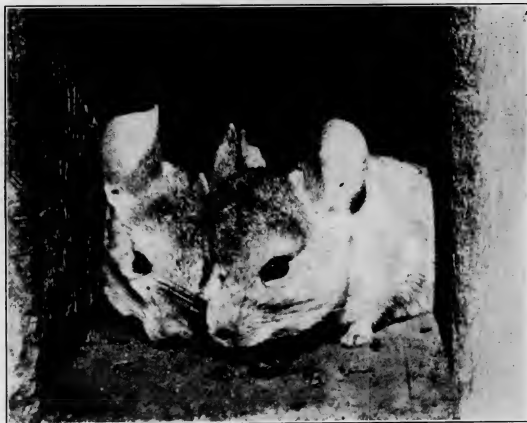


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traded for a neighbor's different line of breeding stock. Their early industry has now grown up into a worth-while business.

Although many companies engaged in fur farming have been of the get-rich-quick, overcapitalized, stock-selling type, this has by no means been the rule. Many of these corporations have paid their stockholders excellent dividends. One company more than a decade ago completed its equipment with 16 pairs of animals in pens, the average price of each pair of which, on paper, was placed at \$11,000. Despite this high initial capitalization, the company has since paid out nearly a quarter of a million dollars in dividends and at the same time has increased its breeding stock to 100 pairs.

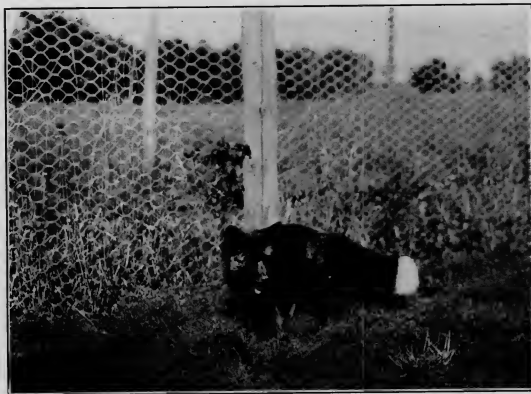


FIGURE 10.—Splendid specimen of a silver fox in captivity

The greatest fur-farming achievement recorded is that of an organization in one of the Great Lakes States that operates what is probably the largest silver-fox business in the world. During the season of 1924 it sold 1,541 skins for a total of \$215,740, or an average price of \$140 each. In 1925 it sold 4,089 pelts at an average price of \$132, with the highest price for a single skin \$520, and, in addition to its heavy sales of skins, retained 1,855 pairs of animals for breeding purposes. In 1926 its sales of skins totaled 3,987, netting \$489,967. The business continued to develop, and in 1928 the sale of 6,538 pelts brought in the record sum of \$1,168,779. In 1929, 7,500 pelts were marketed, the largest single shipment of

silver-fox skins ever offered in any of the raw-fur markets of the world.

A few years ago there was an abundance of inferior silver-fox pelts on the London and American raw-fur markets. This had a depressing effect on the prices offered in the sales, and as a result silver-fox skins were degraded in public esteem. A number of furriers took advantage of the situation to beat down prices. It has sometimes been asserted by raw-fur buyers that pelts produced on ranches are not popular with the fur trade because they are unprime and lack the quality and finish of wild fur. That such is



FIGURE 11.—Pairs of silver foxes are kept in separate inclosures

not the case is demonstrated by the fact that individual pelts during the boom days of the industry sold as high as \$2,000 each. During February of 1922, 2,375 silver-fox pelts from ranches in the United States and Canada were sold in London, and the pelt that brought the top price of the market, \$631.68, was from a ranch-raised fox produced in New York State. During the year 1928 approximately 80,000 silver-fox skins produced on ranches were offered for sale on the raw-fur markets of the world, and the top price paid for a single pelt was \$850.

That fur can be produced satisfactorily on farms is further demonstrated by the fact that 98 per cent of the silver-fox pelts sold on the raw-fur markets to-day are from ranch-bred foxes.

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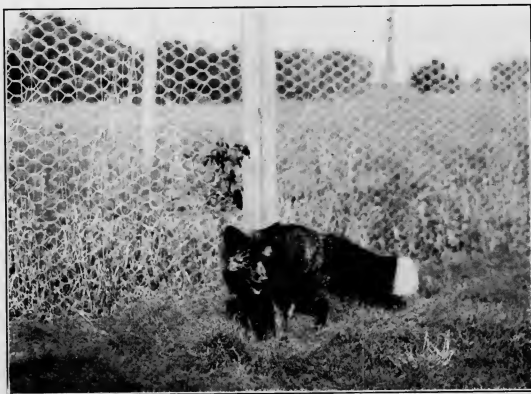


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## MUSKRAT "FARMING"

Muskrat "farming" has had a great influence on causing marsh-land values to advance in price. (Figs. 12 and 13.) Practically all the choice marsh areas bordering on the Great Lakes and the coastal marshes of New Jersey, Delaware, Maryland, and Louisiana are operated as muskrat farms. This is also true of the more desirable inland marshes existing principally in the northern tier of States. Formerly these areas were considered useless. Now, however, because of the increased value of furs, many of the marshes yield a greater income and are worth more than cultivated lands in the same vicinity. Large areas that are devoted to muskrat farming yield profitable returns every year. All that is necessary is to



FIGURE 12.—Muskrat houses are more numerous where food is abundant

maintain the food supply and guard against depleting the stock by too close trapping.

In many instances financial difficulties have been solved for families that probably would have remained poverty stricken had it not been for the income-yielding possibilities on their marsh holdings offered by the muskrat industry. The lands of these soil-poor people were not adapted for agriculture even had they been drained. The muskrat has been their salvation.

The great marsh areas and cypress swamps of Louisiana are now being exploited commercially for the fur crop. Large holdings under single control are patrolled to prevent poaching. Trapping is so regulated that an optimum population of fur bearers is maintained. Already the muskrats are yielding a large and profitable

return under this control of wild conditions. (Figs. 14 and 15.) One land company holding 165,000 acres of swamp area harvested last



FIGURE 13.—Trapper following his trap line through a muskrat marsh



FIGURE 14.—Trapper skinning a muskrat

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## MINK FARMING

A keen interest has been manifested in mink farming (fig. 16) since the beginning of the present century, but it has been spasmodic rather than sustained. Mink farming, however, is not altogether in the experimental stage, for minks are being raised successfully in captivity, and the quality of fur produced on farms is in no way inferior to that trapped in the wild. Minks are very prolific, and when fed and handled properly they breed and produce young regularly, their litters usually numbering 6, 7, or 8. Those who have made money in mink farming thus far have sold the animals chiefly for breeding purposes. Further developments are necessary

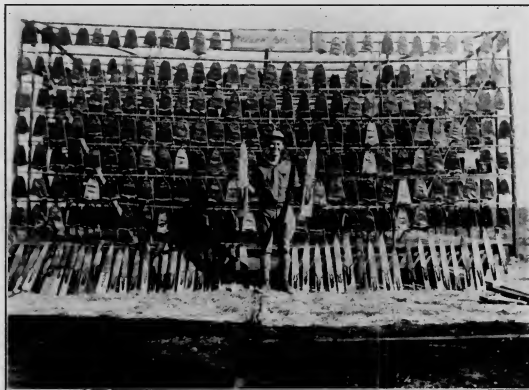


FIGURE 15.—A fine collection of muskrat and mink pelts

before one can determine whether their production for fur in captivity can be made profitable. A few years ago a young man employed at the Fur Animal Experiment Station maintained by the United States Department of Agriculture in New York State resigned and went into the business of mink raising. At the end of the second year he paid all his family and ranch expenses and ended the season with a \$1,200 bank balance. Last year he contracted for the sale of all surplus minks at \$350 to \$400 a pair.

Minks are bold and courageous, and in the wild will attack and kill for food species heavier than themselves, such as the rabbit and the muskrat. They also eat mice, rats, chipmunks, squirrels, and birds and birds' eggs of many kinds, including waterfowl and other

ground-frequenting species. Along water fronts they capture fish of different species, which they pursue in the water. They vary this diet with snakes, salamanders, insects, crustaceans, and mussels.

The American mink is one of the most valuable members of the weasel family. With the growing demand for furs, the number of minks in the wild is steadily decreasing, and this has stimulated efforts to establish mink ranches.

## RACCOON FARMING

No fur animal is hunted or trapped more closely than the raccoon. Some States class this mammal as game, others as a fur bearer,



FIGURE 16.—Large minkeries such as the one above illustrated are in operation in various sections of the country

and still others consider it as both a game and a fur animal. It is pursued as game, and hunting it at night with dogs and torches is a popular sport. The dens and nests of raccoons are destroyed by the methods commonly used in the night hunts, and this acts as a check on the production of the species. The double drain on the native stocks of raccoons resulting from trapping for fur and hunting for sport is causing an alarming decrease in the annual supply.

The demand for live raccoons for both fur farming and restocking purposes has encouraged a great many persons to raise the animals in captivity. (Fig. 17.) It is quite likely that raccoon fur will be produced commercially under controlled conditions within the near future.

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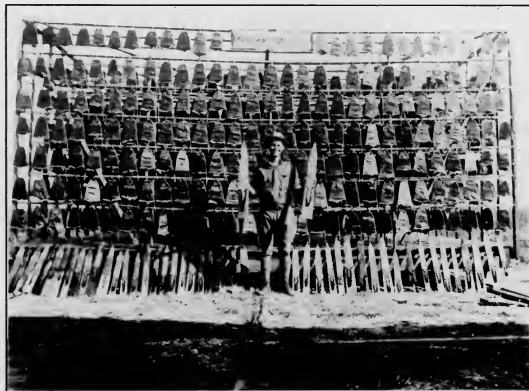


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## BEAVER FARMING

Raising beavers under complete control (fig. 18) is still in the experimental stage, and it has yet to be determined whether it will prove profitable. To prevent beavers from escaping or doing damage to neighboring property it may be necessary in certain sections of the country to fence part or all of the land at considerable expense, and this raises a serious operating problem. Furthermore, production costs would be further increased if beavers were removed from their natural habitat and placed in breeding pens and all their food had to be hauled to them. In figuring possible profits it is to be remembered also that beavers



FIGURE 17.—Raccoons are fond of sweet fruits

are not so prolific as other fur animals and that it may take five to eight years for a small colony to increase sufficiently to yield returns on the investment.

Restocking suitable areas with beavers and giving them proper protection seems to be the most practicable method of producing beaver fur in commercial quantity.

## THE FUR FARM SITE

Generally the location of a livestock farm determines the class of stock to be produced. In those sections of the country that are adapted to grazing and the growing of hay, farmers engage in dairying. The Corn Belt is excellent for raising pork and beef, while the range lands are adapted to cattle, sheep, and goat production. Fur animals are not directly dependent upon the products of the soil, and therefore a large portion of the land utilized for

fur farming is usually of little or no value for crop growing. Fur animals, except muskrats and beavers, can be raised on any type of soil that is well drained and reasonably well shaded. Suitable sites are found in practically every one of the northern tier of the United States, from New England westward to Washington and Oregon, and in the cooler parts of California, Colorado, Kansas, Iowa, Missouri, Illinois, Indiana, Ohio, Pennsylvania, and New Jersey, as well as in Alaska and all the Provinces of Canada.

Although fur farms were formerly established in every conceivable place, the trend at present is to locate them near towns or



FIGURE 18.—Young beavers take well to artificial feeding

cities. The meat products and fish that are the main sources of food for the animals are more readily obtainable in towns and cities. Good roads facilitate the hauling of these and other necessary supplies and construction materials.

Not all the valuable furs come from northern localities, though the production of fur of fine quality is undeniably related to climate. It has been demonstrated, however, that the manner of feeding and handling the stock in captivity is of the greatest importance to the quality of fur produced, regardless of the climate. A long, cold winter with fair rainfall, principally in spring, is conducive to the production of good fur. Hot summers are not

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detrimental, if short and followed by a season of frosty weather, a time during which the animals can renew their coats.

In the infancy of fur farming most of those engaged in the industry thought that dense shade on their ranches was absolutely essential. Every animal likes to lie in the shade during extremely hot weather to escape the direct rays of the sun, but a happy medium of shade and sunshine is necessary for the comfort of fur animals as well as for maintaining them in good health.



FIGURE 19.—View of the main fur ranch on the United States Fur-Animal Experiment Station, Saratoga Springs, N. Y., showing watch tower from which observations of the animals are made

Sunshine is the best natural disinfectant for keeping the dens, pens, and grounds clean and sanitary.

There is ample basis for a sound industry in propagating fur animals. The business is growing and should become a permanent addition to agricultural development.

#### FUNCTIONS OF THE UNITED STATES FUR-ANIMAL EXPERIMENT STATION

Through the instrumentality of the United States Fur-Animal Experiment Station and other fur investigations of the Bureau of Biological Survey of the United States Department of Agriculture, valuable information is being developed regarding all the species of fur bearers now being propagated on fur ranches in the country. Their habits are observed here and elsewhere, and investigations are made of the best management practices regarding feeding, breeding, and housing captive animals and the prevention or control of the diseases and parasites to which they are subject when concentrated in numbers greater than are ordinarily found in small areas in the wild.

Not only is the Adirondack area, New York, in which this station is situated noted for the quality of the fur produced in the wild, but the station site itself is well adapted to meet all the requirements for raising fur animals in captivity. In addition it is readily accessible for bringing in stock, building materials, feed, and other supplies. These features were considered essential when a location was being sought for the station.

The station grounds are on a 20-acre tract of well-drained soil (figs. 19 and 20), about three-fourths of which are covered with an excellent forest growth, which makes it all the more suitable for the fur bearers. Conveniently situated on a State road, only 4 miles from Saratoga Springs, N. Y., it is easily reached by the public. To accommodate visitors the station is open to them on Wednesdays



FIGURE 20.—Corner of the fox ranch on the Fur-Animal Experiment Station, in the section containing the fox-breeding pens

and Sundays from June 1 to December 1 between the hours of 10 a. m. and 4 p. m.

The prime object of the Fur-Animal Experiment Station is to determine the most efficient methods of producing fur bearers in captivity. The station is not operated as a farm for commercial profit through the sale of either breeding stock or pelts, but all energies are directed to developing economical methods of producing fur of fine quality, insuring sanitary surroundings for the animals, and preventing outbreaks of disease or infestation of parasites. Surplus animals are pelted, however, but the proceeds from the sale of the skins are deposited in the United States Treasury and are not available for extending the work of the station. No live animals are sold for any purpose.

The animals maintained at the experiment station include, or have included, red, cross, and silver foxes, martens, minks, skunks,

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The animals maintained at the experiment station include, or have included, red, cross, and silver foxes, martens, minks, skunks,



badgers, and others. Additional species will be experimented with as the work develops and the funds permit. The equipment of the station includes modern pens (fig. 21), dens, and nest boxes for the animals; a laboratory and administration building; a utility house containing cook room, feed room, and carpenter shop; a watch tower from which the animals can be observed when necessary without disturbing them; a storehouse for miscellaneous equipment; and a comfortable house and other buildings for the use of the caretaker and his family. Two large areas are inclosed with guard fence. One of these contains breeding pens, pens for the young, and the watch tower, and the other, called the "furring pen," is used as a developing yard for the foxes. Foxes kept in the

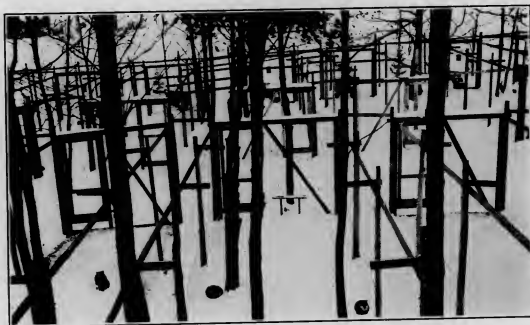


FIGURE 21.—View of fox-breeding pens as seen from the watch tower on the United States Fur-Animal Experiment Station

large furring pen do well and fur out better than those kept constantly in the breeding pens, and although they consume more food there, as they have greater freedom for exercise, the lessened labor and time in caring for them more than offsets the increased cost of feeding.

One of the chief lines of investigation being conducted at the experiment station for the guidance of fur farmers throughout the country is concerned with foods and feeding. In the experiments, which have to do chiefly with foxes, facts are developed under three headings. These are concerned with (1) the simplest and most satisfactory methods of preparing the feed and giving it to the animals; (2) the quantity required during various seasons of the year; and (3) the best feeds and combinations of feeds for animals of all ages.

Wholesome feeds are supplied to all animals at the experiment station, and the water used is pumped from a deep well. Feedings are usually once daily, but under certain conditions both morning and evening meals are given. Practically all the feed is given raw and in individual aluminum pans. The main ration consists of a mixture of ground raw meat, milk, cereal mixture, water, and cod-liver oil. The cereal mixture is prepared from bread that has been kiln-dried, shredded-wheat waste, wheat germ, corn-oil cake meal, fish meal, edible bone meal, alfalfa meal, and iodized salt. The quantity of feed consumed daily by each fox ranges from about 9 to 14 ounces.

Modern sanitation methods are strictly insisted upon throughout the station, for the necessity for cleanliness and sanitation can not be overstressed if fur animals are to be produced profitably. Sanitary surroundings are as essential to the health of the captive fur animals as to that of other kinds of farm livestock. Cleanliness and common-sense methods in management are of first importance in keeping fur animals in health and vigor. All dens and pens are kept as clean as possible, a pure and fresh water supply is provided, and after each meal all the feeding dishes are collected, cleaned, and sterilized.

The methods developed in disease control through cooperation with the University of Minnesota are carefully followed at the experiment station. In spite of the strictest sanitation, some diseases break out among fur animals on farms, and special studies are being made of those that affect foxes. Thus far four distinct diseases have been described through the cooperative research work being conducted. All of these and possibly some others not yet recognized have in the past been known by the one term "distemper." It is now known that separate kinds of treatment and control are required for each, that the history of outbreaks is not the same, and that the mortality rate in the different diseases varies. Special note is made of these matters, the class of animals affected, their symptoms, and the organs involved.

Most outbreaks of diseases on fur farms have been traceable to animals brought from other farms or from fox shows. In the early stages of the investigations of fur-animal production lack of laboratory facilities and of adequate funds prevented the necessary studies of the bacteriology, pathology, and parasitology of infected stock. It was to correct this defect in investigational methods that arrangements were made with the University of Minnesota for a program of cooperative research on the diseases of fur animals. With the causes of infection known, and accurate methods of diagnosis worked out, it is more possible to combat the disease outbreaks that occur. The work at the station and at the university

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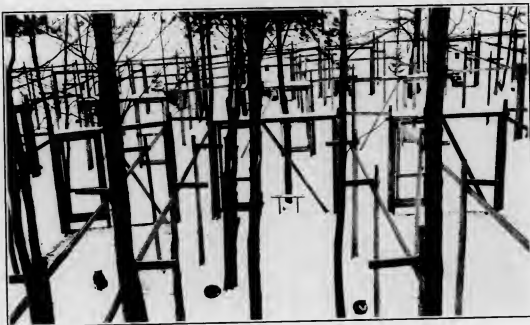


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Improved methods of handling diseased animals during treatment are being devised, and, to acquaint veterinarians and others with the best methods of handling foxes, a motion-picture film was made at the experiment station and has been widely used. Without taking proper precautions and using the right kind of instruments, an operator is likely to suffer severe injury in handling his stock, either for examination or for the treatment of disease.

Studies have been in progress at the station for some years of the tolerance of foxes to the various drugs employed as anthelmintics and for other therapeutic purposes. Such intestinal parasites as can be reached by drugs given through the mouth can be fairly well controlled by treatments recently developed. Additional studies are required, and are being pursued so far as the facilities permit, of the parasites of fur animals, their life histories, and practical means of control. Whenever reliable information is developed at the station, or through visits of members of the station staff to private fur farms, or through other laboratory investigations, the facts are made available to the general public in the form of letters, press articles, radio talks, or bulletins, or in actual demonstrations when these are feasible. It is the primary function of the Fur-Animal Experiment Station to acquaint fur farmers with the latest developments on all phases of fur farming.

The Bureau of Biological Survey desires exceedingly to meet its obligations to the fur farmers of the country. Every effort is made to acquaint breeders with discoveries made at the station regarding improved management practices in breeding, feeding, and handling fur bearers in captivity. Field work of representatives of the station and of the Washington and cooperating offices in inspecting fur farms is resulting in the accumulation of much valuable information on the various problems confronting fur farmers and in many notable improvements in fur-farming practices. This information is available to all concerned, and fur farmers are invited to utilize the facilities provided by the Biological Survey through its Fur-Animal Experiment Station to the greatest possible extent. The station is maintained to benefit fur farmers individually and collectively, so that a stable industry may be established in fur production, one efficiently managed and intelligently directed, with future progress constantly in view.

#### RABBIT RAISING FOR FOOD AND FOR FUR STUDIED AT GOVERNMENT EXPERIMENT STATION

The methods of production of domestic rabbits both for fur and for food that are now being developed at the United States Rabbit Experiment Station, at Fontana, Calif., can be followed with profit by various producers of rabbits throughout the country. This experiment station (fig. 22) was established in 1927 by the United States Department of Agriculture through the cooperation of local rabbit breeders in California and the National Rabbit Federation and is operated by the Bureau of Biological Survey. Its primary



FIGURE 22.—Headquarters of the Rabbit Experiment Station maintained by the United States Government, Fontana, Calif.

object is to provide reliable information based upon experimentation for the benefit of all who are engaged in the rabbit industry. The establishment of the station fills a recognized need of breeders who are engaging in the business on an extensive scale and of farmers and others who are raising only a few animals as a side line to regular farming operations. The accomplishments at the station for the rabbit industry generally will be of help also to those who contemplate engaging in the business as well as to the younger members of farm and other families who are raising rabbits merely as a "pin-money" venture.

Rabbit raising has advanced, however, beyond the stage of a pet-stock business and is now an important agricultural industry throughout the United States, particularly on the Pacific coast. In many rural sections rabbits are being produced in great numbers. In parts of the West almost all farmers keep a few pairs, and some

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An industry of such proportions, to be permanent and stable, must be based on scientific research. The cost of research is good insurance on both large and small investments in rabbitries. Prob-

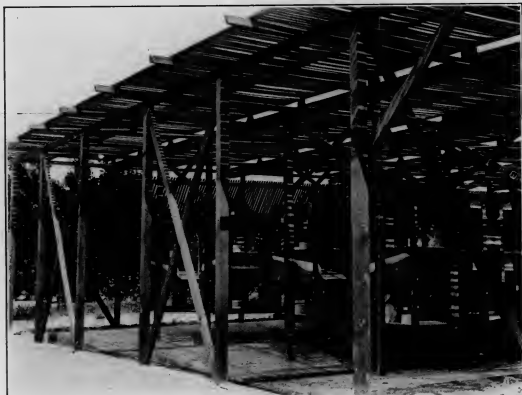


FIGURE 23.—New type of open-air hutch unit for rabbits used at the United States Rabbit Experiment Station

lems confront all rabbit raisers regarding feeding, breeding, and housing conditions, and preventing the ravages of diseases and parasites among their stock. To provide a means of solving such problems and of developing economical and efficient methods of production was the aim of the organizations and individuals who tendered their cooperation in the establishment of the rabbit station.

The station is on the site of a 5-acre orange grove, and the equipment furnished by the cooperators includes this tract, an administration building that contains laboratories, offices, and assembly hall, various open and closed types of shelters for hundreds of hutches (figs. 23 and 24), which are kept cool on hot days by a sprinkler system, a large feed-storage house for hay and grain, and an attractive residence for the director and his family.

The means by which rabbits can be raised to a marketable age at minimum expense, keeping in mind the opportunities for maximum profits from meat and fur, are given special attention at the station. These ends are being attained partly through a study of the factors that reduce losses among young rabbits and increase the prolificacy of the adults. The station was recently enabled to render exceptionally valuable service to the rabbit industry through cooperation with the Universities of Minnesota and



FIGURE 24.—Close view of rabbit hutches shown in Figure 23

Southern California in studying and controlling a malady among domestic rabbits that had attained epizootic proportions. The laboratory facilities at the station were not adequate at the time to cope with the situation without the aid of research workers in other institutions. It is planned to expand this line of research as rapidly as facilities are provided for the purpose, for until authentic and adequate information can be developed for controlling outbreaks of disease, the appeals to the station for help made by producers of rabbits can not be fully answered, and large investments in the business are thus in jeopardy.

The equipment and facilities now available at the station include 4 inclosed breeding buildings, 4 outside rabbit runs, a new open unit with a total capacity of approximately 300 individual hutches, and 8 pens. This equipment represents a wide variety in types of

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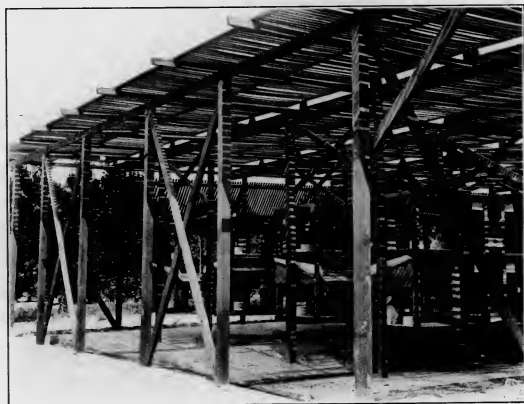


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construction, and considerable information regarding proper housing will result from a comparison of the buildings in use.

A fertilizer experiment for the purpose of establishing a market value for rabbit manure is now being conducted at the station, in cooperation with the official farm adviser of the county. The results promise to be valuable not only to the development of the rabbit industry but to fruit growers and gardeners as well.

Farm boys and girls in California have taken a keen interest in rabbits, and the director of the station has assisted agricultural extension agents in organizing rabbit clubs among them. Invitations have been sent to the schools of California to visit the station, and the boys and girls interested in the club work have taken advantage of this opportunity to observe modern methods of raising rabbits and to learn of the profits that may be made in the industry.

## THE FUR INDUSTRY ON THE PRIBILOF ISLANDS, ALASKA

By WARD T. BOWER, Chief, Division of Alaska Fisheries  
Bureau of Fisheries, U. S. Department of Commerce

### THE FUR-SEAL HERD

IN 1786, 45 years after the discovery of Alaska, Gerassim Pribilof, a Russian navigator, discovered the Pribilof Islands, a rocky and treeless group of volcanic origin, about 300 miles off the mainland of Alaska, in Bering Sea. Of these, St. Paul Island, about 14 miles in length, St. George Island, 12 miles long, and Sea Lion Rock, a small islet adjacent to St. Paul, are the breeding grounds of the North American, or Alaska, fur-seal herd. It now numbers more than 1,000,000 animals and contains more than 80 per cent of the fur seals of the world.

Fur seals should not be confused with the common hair seals, which are widely distributed over the world. Hair seals lack the fine, soft underpelage of rich fur that characterizes the fur seal and makes it so valuable.

The Pribilof Islands are the only place where the Alaska herd ever comes ashore. This occurs during the summer months, while other periods of the year are given over to an annual migration when some of the animals go as far south as the latitude of southern California, about 3,000 miles from their summer home. In this migration the Alaska herd confines its journeying to the North American side of the Pacific Ocean.

The official nomenclature applied to the Alaska fur-seal herd is of interest. The adult males are called "bulls" (fig. 25), the adult females "cows," the immature males from which killings are made for pelts are called "bachelors," and young of the season of both sexes are designated "pups." The family group is known as the "harem." (Fig. 26.)

There is a great disparity in the size of the sexes at maturity. The breeding bulls average more than 500 pounds in weight and reach a maximum of upward of 700 pounds. The cows average about 75 pounds in weight and rarely ever attain a weight of 100 pounds. The cows reach maturity at 3 years of age, but the males do not mature until 6 or 7 years of age. Each cow gives birth to one pup each year. The period of gestation is about 11 months. The

fact that fur seals are highly polygamous makes it possible to kill the surplus bachelor seals without decreasing the number of young that may be born.

The Pribilof Islands were under Russian management for a period of 81 years, from the time of discovery until 1867, when Alaska was purchased by the United States, and the herd passed to the control of this Government. Available records indicate that from the time of discovery until 1834 about 2,000,000 pelts were taken at the Pribilof Islands. By that year the herd had become so reduced in numbers that restrictive measures were applied, particularly the discontinuance of the earlier practice of killing



FIGURE 25.—Breeding bull fur seal, Pribilof Islands, Alaska

females. From 1835 to 1867 the records indicate that about 600,000 pelts were taken on the Pribilof Islands, and during this period the herd increased to an estimated total of from 2,000,000 to 3,000,000 animals. Nobody knows how many seals were in the herd before the Pribilof Islands were discovered by man, but indications are that it may have contained as many as 4,000,000 animals.

In the years 1868 and 1869 approximately 329,000 fur seals were killed on the Pribilofs by various independent groups. In 1870 the Alaska Commercial Co. was given a 20-year lease of the sealing privilege, and in 1890 a similar privilege of the same duration was granted the North American Commercial Co. In the first 20-year period 1,977,377 fur-seal skins were taken, the annual

rental and a tax on which yielded the Government \$6,020,152. During the second 20-year leasing period 342,651 sealskins were taken, and the revenue to the Government was \$3,453,844. In 1910 the leasing system was discontinued, and since that time, under the acts of Congress of April 21, 1910, and August 24, 1912, the Alaskan fur-seal herd has been administered by the Secretary of Commerce through the Commissioner of Fisheries.

In 1910, when the Government assumed direct control and began all sealing operations at the Pribilof Islands on its own account, the Pribilof fur-seal herd numbered only about 130,000 animals. The chief reason for the decrease in the herd to this comparatively small remnant of its former size was the exceedingly wasteful and objectionable practice of pelagic sealing, or the killing of fur seals in the water, which began as a commercial enterprise



FIGURE 26.—Fur-seal harem, Pribilof Islands

about 1882 and reached its maximum in 1894, during which year more than 61,000 skins were taken at sea in this manner.

The practice of pelagic sealing is altogether indefensible either upon economical or humane grounds. Pelagic sealing takes heavy toll of the breeding female seals, which are exempt from killing when sealing operations are confined to the land. Before the pups are weaned their mothers make regular trips to sea, sometimes going a distance of 100 miles or more from the Pribilof Islands in search of food. When female seals are killed at sea, therefore, the invariable result is the death by starvation of their pups left on shore. It is obvious also that many unborn young also are lost. Another very wasteful phase of pelagic sealing was that the pelts could be taken from only about one in five of the animals killed; the remainder would sink before the hunters were able to reach them.



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FIGURE 25.—Breeding bull fur seal, Pribilof Islands, Alaska

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In the years 1868 and 1869 approximately 329,000 fur seals were killed on the Pribilofs by various independent groups. In 1870 the Alaska Commercial Co. was given a 20-year lease of the sealing privilege, and in 1890 a similar privilege of the same duration was granted the North American Commercial Co. In the first 20-year period 1,977,377 fur-seal skins were taken, the annual

rental and a tax on which yielded the Government \$6,020,152. During the second 20-year leasing period 342,651 sealskins were taken, and the revenue to the Government was \$3,453,844. In 1910 the leasing system was discontinued, and since that time, under the acts of Congress of April 21, 1910, and August 24, 1912, the Alaskan fur-seal herd has been administered by the Secretary of Commerce through the Commissioner of Fisheries.

In 1910, when the Government assumed direct control and began all sealing operations at the Pribilof Islands on its own account, the Pribilof fur-seal herd numbered only about 130,000 animals. The chief reason for the decrease in the herd to this comparatively small remnant of its former size was the exceedingly wasteful and objectionable practice of pelagic sealing, or the killing of fur seals in the water, which began as a commercial enterprise



FIGURE 26.—Fur-seal harem, Pribilof Islands

about 1882 and reached its maximum in 1894, during which year more than 61,000 skins were taken at sea in this manner.

The practice of pelagic sealing is altogether indefensible either upon economical or humane grounds. Pelagic sealing takes heavy toll of the breeding female seals, which are exempt from killing when sealing operations are confined to the land. Before the pups are weaned their mothers make regular trips to sea, sometimes going a distance of 100 miles or more from the Pribilof Islands in search of food. When female seals are killed at sea, therefore, the invariable result is the death by starvation of their pups left on shore. It is obvious also that many unborn young also are lost. Another very wasteful phase of pelagic sealing was that the pelts could be taken from only about one in five of the animals killed; the remainder would sink before the hunters were able to reach them.

The discontinuance of pelagic sealing, under the terms of the fur seal convention of 1911 between the United States, Great Britain, Japan, and Russia, has contributed very greatly to the upbuilding of the fur-seal herd. The benefits of this international agreement, as well as the improved methods in administering the herd at the islands, are strikingly apparent when it is realized that in the 18 years of direct Government control and operation from 1912 to 1929, inclusive, the herd has increased approximately eightfold, and that during this period 342,352 fur-seal skins have been taken on the Pribilofs, 40,068 of them in 1929.

Under the terms of the Fur Seal Convention of 1911, and in return for the surrender of such profits as the nationals of Canada and Japan had been deriving from pelagic sealing operations, each of those countries is entitled to 15 per cent of the number of fur-seal skins taken annually on the Pribilofs. To date these countries have not taken actual delivery of their respective shares of skins, but instead each has received 15 per cent of the net proceeds of the skins sold by the United States. This arrangement has been considered of profit and advantage to all interests concerned.

Although the treaty states that it would continue in effect 15 years, it also states that it will continue in effect thereafter until terminated by 12 months' written notice given by one or more of the parties to all the others. No such notice has been given.

The treaty provides that Indians or other aborigines dwelling on the coast north of the thirtieth parallel of north latitude may carry on pelagic sealing in canoes or undecked boats propelled wholly by paddles, oars, or sails, and not transported by or used in connection with other vessels, and manned by not more than five persons each, and also without the use of firearms. It is prohibited, however, to engage in such sealing operations under contract to deliver the skins so taken to any person. Under these provisions of the treaty an average of about 3,000 skins have been taken in recent years by coastal Indians of the United States and Canada each season while the herd was on its annual migration northward. Before these skins can be lawfully disposed of they must be authenticated by duly constituted officials as to the legality of capture.

In conserving the fur-seal herd of the Pribilof Islands the Government has adopted the policy of providing adequate reserves of breeding animals so as to insure the future growth and welfare of the herd. In order to carry this into effect several thousand 3-year-old male seals are marked by clipping a patch of fur from the head so that they will not be killed in subsequent drives during the remainder of the season. This is a simple and effective process. When these reserved animals return the next year as 4-year-olds,

the mark has disappeared and their increase in size automatically exempts them from killing operations.

The growth of the fur-seal herd in the 18 years from 1912 to 1929, inclusive, since the Government has actually engaged in sealing operations, has been very satisfactory. In the following table is shown the number of skins taken on the Pribilofs and the number of seals in the herd during this 18-year period:

INCREASE IN THE ALASKA FUR-SEAL HERD, 1912-1929

Year	Skins taken on the Pribilofs	Number of seals in herd	Year	Skins taken on the Pribilofs	Number of seals in herd
1912.....	3,191	215,738	1921.....	23,681	581,443
1913.....	2,406	268,305	1922.....	31,156	604,962
1914.....	2,735	294,687	1923.....	15,920	653,008
1915.....	3,947	363,872	1924.....	17,219	697,158
1916.....	6,468	417,281	1925.....	19,860	723,050
1917.....	8,170	468,692	1926.....	22,131	761,281
1918.....	34,890	496,432	1927.....	24,942	808,870
1919.....	27,821	524,235	1928.....	31,059	871,513
1920.....	26,648	552,718	1929.....	40,068	971,527

The Pribilof Islands constitute a special Government reservation. No one may proceed there and no vessel may touch there except in stress of weather, unless a permit has first been obtained



FIGURE 27.—Fur-seal rookery, Pribilof Islands

from the Secretary of Commerce. Since the Pribilofs are off the ordinary lanes of travel, visits by vessels are infrequent other than Coast Guard cutters, the annual supply ship, and a vessel operated by the Bureau of Fisheries. As a result, comparatively few people have ever had the opportunity of inspecting the seal rookeries (fig. 27) and noting the remarkable assemblage of animal life that



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it is possible to observe there. During the height of the breeding season in July, one may see from a single hill about 300 feet high rookeries containing more than 100,000 fur seals in massed array on a comparatively few acres of ground. The counterpart of this scene can not be found the world over.

All sealing and other operations on the Pribilof Islands are performed, under supervision of a staff of white employees, by the 350 Aleuts who reside in the villages on St. Paul and St. George Islands. These natives are in effect wards of the Government. They receive a nominal fee of 75 cents for each seal skin and \$5 for each fox skin taken, but their primary compensation is through the issuance by the Government of all necessities of life. They are



FIGURE 28.—St. George village, Pribilof Islands, Alaska

also provided with schools, hospitals, and medical and other facilities to insure their comfort and welfare. Modern buildings, for the most part of concrete structure, and many other comforts and conveniences are furnished them by the Government. (Figs. 28 and 29.)

The taking of the fur-seal pelts occurs chiefly in the month of July. The harems or family groups occupy rocky sections of the shore in 22 different rookeries. Ordinarily only the breeding seals and pups are found there. Adjacent to the rookeries, however, are the so-called hauling grounds, where the immature males and some unattached bulls congregate. The seals selected for killing are driven inland a short distance from these hauling grounds. The process of driving them is not much more difficult than that of driving a flock of sheep, although of course the seals travel much more slowly.

The skull of the seal is very thin on top and the animal is quickly and humanely dispatched by a blow with a stout cudgel like that of an elongated baseball bat. Thereafter the skins are removed either in the usual manner or by stripping after a few cuts are made to permit the pelt to be readily pulled from the carcass. If the skins are stripped, they are immediately transported to the washhouses, and after cooling and cleaning are blubbered before being placed in salt. (Fig. 30.)

The skins that are removed by the ordinary and long-established method of skinning close to the pelt are not blubbered at the



FIGURE 29.—St. Paul village, Pribilof Islands, Alaska

islands, but are salted with a thin layer of blubber next to the pelt. After thorough curing in salt for from 10 days to 2 weeks, the skins are in due time rolled singly into bundles with a plentiful supply of salt on the flesh side, which is turned inward. These bundles are packed usually about 60 to the barrel and are transported by steamer to Seattle, Wash., from which place they are dispatched to the factory at St. Louis, where they are put in cold storage to await dressing and dyeing. (Figs. 31 and 32.)

A period of about 60 days elapses before a skin is dressed, dyed, and made ready for market. Approximately 130 distinct manipulations or treatments, each requiring great skill and care, are involved in the processing of fur-seal skins. The result is a superfine product

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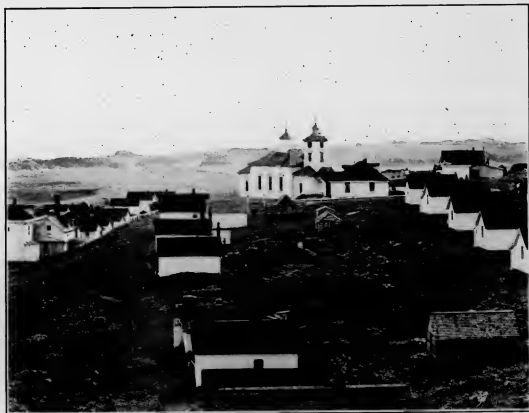


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In recent years a change has been made in the time-honored practice of applying black dye to fur-seal skins. This has been superseded in part by using a deep and rich brown color, designated Bois de Campêche, or logwood brown, that has met with popular response and is steadily growing in favor.

It is of interest to note that in the 63 years since Alaska was acquired from Russia the Territory has produced fur-seal skins to

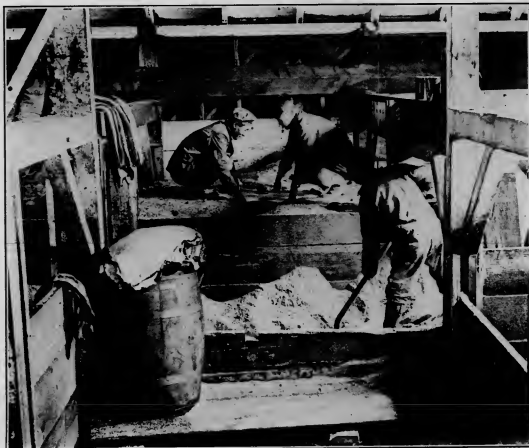


FIGURE 30.—Salting fur-seal skins on the Pribilof Islands

the value of about \$63,000,000, or approximately nine times its purchase price. Each year the take of sealskins is increasing and the herd is growing steadily. The outlook is extremely promising under the present policy of conservation and wise administration under the general direction of the Secretary of Commerce. There appears to be no reason why the fur-seal herd of the Pribilof Islands should not be entirely restored to its abundance of former days. Splendid strides toward that end have already been made. The conservation of this great natural resource through international agreement offers a most striking example of the importance of international cooperation in wild-life preservation.

#### BLUE-FOX RAISING

The United States Government engages also in blue-fox farming on St. Paul and St. George Islands, incidental to the fur-sealing activities on the Pribilof Islands. On these islands the foxes are not confined in pens or inclosures, but are allowed to roam at will. (Fig. 33.) Their food consists chiefly of fur-seal carcasses set aside for that purpose, birds, and crustaceans and other invertebrates found on the beaches. The natural food supply is augmented during the winter months by biscuits made of cereals and fur-seal oil from the by-products plant on St. Paul Island.

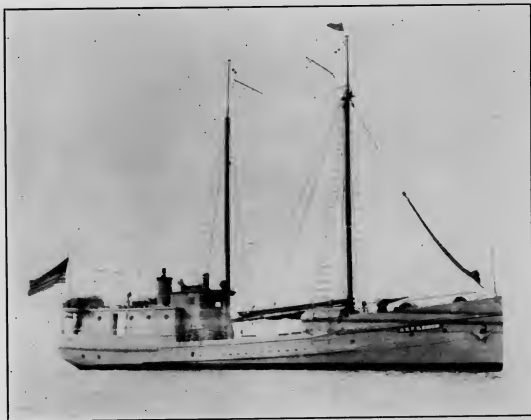


FIGURE 31.—United States Bureau of Fisheries tender Eider at the Pribilof Islands, Alaska

The capture of foxes on St. Paul is accomplished by means of box traps and steel traps, but on St. George, where there is less opportunity for the animals to obtain natural food, they are readily enticed into a central trapping inclosure (fig. 34), which makes selective killing possible and also permits the release of a suitable breeding reserve. These released animals are marked by clipping a patch of fur so that they are readily distinguishable if they come into the trapping inclosure later in the season.

The extent of the operations may be noted from the fact that in the winter of 1929-30, 193 blue and 31 white fox pelts were taken on St. Paul Island, while on St. George the take was 550 blues and

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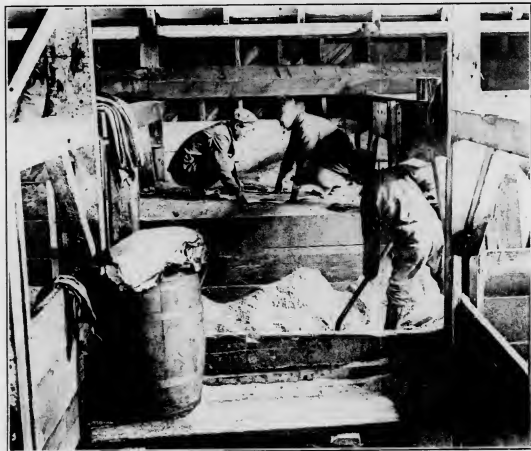


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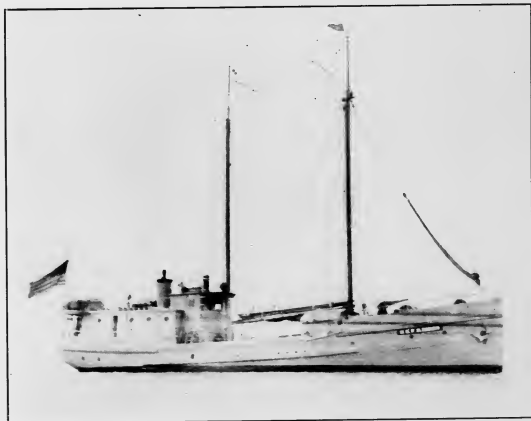


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1 white. The total for both islands is 775 skins, and in addition 618 animals were released as breeding stock. It is estimated that there were also hundreds of foxes that were never captured either for killing or for marking and release as a breeding reserve. All



FIGURE 32.—Processing United States Government fur-seal skins at St. Louis, Mo.



FIGURE 33.—Blue foxes run unmolested on Alaskan islands, where they choose their own mates and dig their dens

white foxes taken are killed, as a systematic effort has been made to develop a pure strain of blues. The small proportion of white individuals taken on St. George is an indication of the success that has attended this practice.

The pelts are forwarded by the supply vessel each summer to Seattle, whence they are sent to St. Louis and in due time are sold at public auction. The proceeds are covered into the Treasury of the United States.



FIGURE 34.—Blue foxes on St. George Island, in the Pribilofs



FIGURE 35.—The raising of blue foxes is increasing in the United States

The raising of blue foxes in the United States and elsewhere on the mainland is a growing industry, and in such places shelters and inclosures are necessary to confine the stock. (Fig. 35.)



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## THE INTERNATIONAL FUR TRADE

By THOMAS J. BIGGINS, Textile Division, Bureau of Foreign and Domestic Commerce  
U. S. Department of Commerce

PRIOR to the World War the bulk of the American catch of furs was sold through English or German firms, and as a general rule the pelts were dressed or dyed abroad. With the outbreak of hostilities the need became apparent for auctions in the United States, and in 1915 the first American fur-auction



FIGURE 36.—The first fur-auction sale in the United States was held in St. Louis, Mo., in 1915

sale was held in St. Louis. (Fig. 36.) Another was held in New York the following year. The St. Louis sales were discontinued, but New York sales are handling the majority of the American skins, as well as enormous quantities of foreign origin.

### EXPORTS AND IMPORTS

Ninety-five per cent by valuation of the raw skins exported from the United States are destined for four countries. In the order of their importance as purchasers, these are Great Britain, Germany, Canada, and France.

The total exports of furs and fur manufactures in 1929 were valued at \$35,674,470, the largest valuation on record with the exception of that of the preceding year, when exports amounted to

\$39,504,272. Raw-fur shipments in 1929 accounted for about 82 per cent of the total, or \$29,113,303. Of this total, the United Kingdom took \$11,309,562 worth; Germany, \$7,805,990; Canada, \$6,731,527; and France, \$2,132,815.

Raw opossum skins led in both quantity and value, 5,413,040 pelts having a valuation of \$6,782,431. Shipments of muskrat pelts were second, with 5,088,437, valued at \$5,445,682. Skunk and civet-cat skins came third, the skins exported totaling 1,985,716, worth \$4,704,764.

Furs and fur manufactures ranked ninth among the commodities imported into the United States in 1929. The total valuation under this classification was \$122,528,580, the second largest on record. The principal items under the raw-fur classification were skins of lamb, kid, sheep, and goat, \$20,812,432; coney and rabbit, \$19,610,808; fox, other than silver or black, \$16,296,254; and squirrel, \$5,134,070. About two-thirds of the value of the dressed-fur importations was represented by dog and goat skins, dyed and dressed. The complete figures follow:

IMPORTATIONS OF FURS INTO THE UNITED STATES DURING THE CALENDAR YEARS 1928 AND 1929

Articles	Unit of quantity	1928		1929	
		Quantity	Value	Quantity	Value
Furs and manufactures			\$118,355,236		\$122,528,580
Furs, undressed			108,782,775		108,528,965
Karakul	Number	149,470	249,084	273,178	487,095
Ermine	do.	503,318	1,470,246	916,571	2,277,186
Fitch	do.	1,343,455	5,259,520	1,199,325	4,883,009
Guanaco	do.	438,523	1,602,279	126,551	324,981
Kolmaki	do.	526,489	2,166,560	638,025	2,227,515
Marmot	do.	2,362,090	4,378,408	2,243,415	3,754,268
Weasel	do.	1,501,737	2,925,069	1,582,183	2,778,385
Monkey	do.	269,499	633,648	272,334	932,187
Opossum	do.	36,887	471,041	38,601	436,835
Hare	do.	559,171	667,553	622,759	771,158
Beaver	do.	2,191,709	3,249,707	2,297,356	3,410,617
Fox other than silver or black	Number	109,925	2,983,463	69,515	2,022,315
Coney and rabbit	do.	1,711,933	16,465,125	1,695,806	16,296,254
Marten	do.	16,397,378	20,270,001	17,493,000	19,610,808
Mink	do.	145,765	3,209,340	213,643	4,017,028
Mole	do.	682,239	3,422,816	873,580	3,926,119
Muskrat	do.	10,283,625	1,305,637	1,852,927	229,837
Squirrel	do.	805,126	1,076,841	980,519	1,268,365
Nutra	do.	8,065,596	7,942,049	7,013,284	5,134,070
Pony	do.	43,605	239,678	37,620	214,864
Skunk	do.	51,306	295,511	195,448	670,214
Wolf	do.	190,043	354,153	196,570	483,966
Lamb, kid, sheep, and goat skins furs	do.	144,922	2,461,042	157,959	2,535,975
Other furs, undressed	do.	8,434,972	15,616,893	9,841,451	20,812,432
Furs dressed on the skin not advanced beyond drying	do.		10,058,111		8,883,284
Coney and rabbit	Number	2,918,532	1,241,532	3,701,839	1,846,025
Silver or black fox, dressed or undressed	do.	1,857	195,780	1,166	133,838
Lamb, kid, and sheep skin furs	do.	234,947	705,772	329,455	1,331,003
Dog and goat skins, dyed and dressed	do.	1,258,104	4,116,700	2,831,259	7,877,008
Other dressed furs	do.		871,283		795,321
Manufactures of furs (except hats):					
Cut fur for hatters use, including fur skins carried	do.	44,088	69,951	26,781	59,063
Plates and mats of dog and goat skins	do.	331,535	1,384,165	422,452	1,576,845
All other manufactures not elsewhere specified	do.		987,278		859,612

\*Undressed furs are admitted free.

\*Dressed furs are dutiable.

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PRIOR to the World War the bulk of the American catch of furs was sold through English or German firms, and as a general rule the pelts were dressed or dyed abroad. With the outbreak of hostilities the need became apparent for auctions in the United States, and in 1915 the first American fur-auction



FIGURE 36.—The first fur-auction sale in the United States was held in St. Louis, Mo., in 1915

sale was held in St. Louis. (Fig. 36.) Another was held in New York the following year. The St. Louis sales were discontinued, but New York sales are handling the majority of the American skins, as well as enormous quantities of foreign origin.

### EXPORTS AND IMPORTS

Ninety-five per cent by valuation of the raw skins exported from the United States are destined for four countries. In the order of their importance as purchasers, these are Great Britain, Germany, Canada, and France.

The total exports of furs and fur manufactures in 1929 were valued at \$35,674,470, the largest valuation on record with the exception of that of the preceding year, when exports amounted to

\$39,504,272. Raw-fur shipments in 1929 accounted for about 82 per cent of the total, or \$29,113,303. Of this total, the United Kingdom took \$11,309,562 worth; Germany, \$7,805,990; Canada, \$6,731,527; and France, \$2,132,815.

Raw opossum skins led in both quantity and value, 5,413,040 pelts having a valuation of \$6,782,431. Shipments of muskrat pelts were second, with 5,088,437, valued at \$5,445,682. Skunk and civet-cat skins came third, the skins exported totaling 1,985,716, worth \$4,704,764.

Furs and fur manufactures ranked ninth among the commodities imported into the United States in 1929. The total valuation under this classification was \$122,528,580, the second largest on record. The principal items under the raw-fur classification were skins of lamb, kid, sheep, and goat, \$20,812,432; coney and rabbit, \$19,610,808; fox, other than silver or black, \$16,296,254; and squirrel, \$5,134,070. About two-thirds of the value of the dressed-fur importations was represented by dog and goat skins, dyed and dressed. The complete figures follow:

IMPORTATIONS OF FURS INTO THE UNITED STATES DURING THE CALENDAR YEARS 1928 AND 1929

Articles	Unit of quantity	1928		1929	
		Quantity	Value	Quantity	Value
Furs and manufactures.....			\$118,355,236		\$122,528,580
Furs, undressed <sup>1</sup> .....			108,782,775		108,528,965
Karakul.....	Number.....	149,470	249,084	273,178	487,095
Ermine.....	do.....	503,918	1,470,246	916,571	2,277,186
Fitch.....	do.....	1,343,455	5,259,520	1,199,525	4,885,000
Guanaco.....	do.....	438,523	1,602,279	126,551	524,981
Kolinsky.....	do.....	526,480	2,166,560	638,055	2,227,515
Marmot.....	do.....	2,362,090	4,378,408	2,243,415	3,754,268
Weasel.....	do.....	1,501,757	2,923,069	1,382,183	2,778,385
Monkey.....	do.....	269,409	635,648	272,254	922,187
Otter.....	do.....	36,887	471,041	38,601	436,834
Opossum.....	do.....	359,171	667,555	622,759	771,155
Hare.....	do.....	2,191,709	3,489,207	2,273,536	3,410,617
Beaver.....	Number.....	109,925	2,983,463	69,515	2,022,515
Fox other than silver or black.....	do.....	1,711,953	16,465,125	1,695,806	16,296,254
Coney and rabbit.....	do.....	16,297,378	20,770,091	17,495,090	19,610,808
Marten.....	Number.....	145,765	3,209,340	213,643	4,017,028
Mink.....	do.....	682,259	3,422,816	873,580	3,926,119
Mole.....	do.....	10,285,635	1,805,637	1,822,927	220,837
Muskrat.....	do.....	808,126	1,076,841	980,519	1,268,565
Squirrel.....	do.....	8,065,596	7,942,049	7,013,284	5,134,070
Nutria.....	do.....	43,605	239,678	37,620	214,864
Pony.....	do.....	51,306	295,511	195,448	670,214
Skunk.....	do.....	190,043	354,153	196,570	483,966
Wolf.....	do.....	144,922	2,461,042	157,599	2,535,975
Lamb, kid, sheep, and goat skin furs.....	do.....	8,434,972	15,616,895	9,841,451	20,812,432
Other furs, undressed.....			10,058,111		8,883,264
Furs dressed on the skin not advanced beyond drying <sup>2</sup> .....			7,131,067		11,984,095
Coney and rabbit.....	Number.....	2,918,532	1,241,532	3,701,839	1,846,025
Silver or black fox, dressed or undressed.....	do.....	1,857	193,780	1,166	133,838
Lamb, kid, and sheep skin furs.....	do.....	234,947	705,772	329,455	1,331,903
Dog and goat skins, dyed and dressed.....	do.....	1,258,104	4,116,700	2,821,229	7,977,088
Other dressed furs.....	do.....		871,283		795,321
Manufactures of furs (except hats):.....					
Cut fur for hatters use, including fur skins carried.....	Pound.....	44,088	69,951	26,781	59,063
Plates and mats of dog and goat skins.....	Number.....	331,535	1,384,165	422,452	1,576,845
All other manufactures not elsewhere specified.....			987,278		890,612

<sup>1</sup>Undressed furs are admitted free.

<sup>2</sup>Dressed furs are dutiable.

## FUR DRESSING AND DYEING

Although fur dressing and dyeing was a fairly well-established industry in the United States in 1914, the total annual output of the plants (fig. 37) in that year was valued at only \$2,875,000. The rapid development of the industry in this country, due in part to the interrupted trade with the continental dressing and dyeing centers, caused the value of products to jump to \$20,384,569 in 1919. This volume has not only been maintained with the return



FIGURE 37.—Interior of a fur dressing and dyeing plant, where muskrat fur is converted into "Hudson seal"

of foreign competition to the field, but it has increased to \$27,357,261 according to the census figures for 1927, the latest available.

The industry is to a large extent centered in and around New York. Of the 168 establishments reporting to the Bureau of the Census, 111 were in New York and 25 in New Jersey.

The Fur Dressers & Fur Dyers Association (Inc.) compile annual figures on the number of skins processed by the members of that association, and these compilations are excellent indices of the numbers of the skins of each kind consumed by American fur manufacturers. The membership of the association is estimated to represent approximately 90 per cent of the industry. The figures for the last two years follow:

NUMBER OF SKINS PROCESSED BY MEMBERS OF THE FUR DRESSERS & DYERS ASSOCIATION (INC.),  
1928 AND 1929

	1928	1929
Karakul, kid, and lamb skins.....	4,546,529	7,583,445
Ermine.....	973,377	938,441
Fitch (German and Russian).....	962,409	589,439
Fox (all classes).....	1,362,546	700,791
Marmot.....	967,796	678,132
Mink (Jap mink not included).....	304,137	315,803
Mole.....	5,770,223	1,902,929
Muskrat.....	4,692,751	4,888,036
Opossum (Australian included).....	818,386	298,220
Skunk.....	819,406	656,159
Squirrel.....	5,264,484	3,604,723
Weasel (Japanese and Chinese).....	1,730,269	1,140,647
All other skins.....	3,927,843	3,658,376
Total.....	32,140,156	26,955,141

## FUR MANUFACTURING

The fur manufacturing industry also is centered largely in New York. Of the 2,756 establishments reporting to the Bureau of the Census in 1927, 2,029 were in New York, 228 in Illinois, 106 in Pennsylvania, 61 in California, 43 in Minnesota, 37 in Ohio, 37 in Wisconsin, 36 in Massachusetts, 24 in Washington, 23 in Michigan, 21 in Maryland, 20 in Iowa, 19 in Missouri, 16 in New Jersey, 10 in the District of Columbia, 8 in Indiana, 7 in Maine, 6 in Oregon, 5 in Connecticut, 3 in Colorado, 3 in Montana, 3 in Nebraska, and the remaining 11 in 10 other States.

The total value of products in 1927 is given as \$299,615,047, the largest figure on record. This was a gain of 17.8 per cent over the previous figures for 1925. The Bureau of the Census furnished totals in 1927 to show the proportionate value of the different products of the industry. The figures follow:

## FUR PRODUCTS OF THE UNITED STATES, BY KIND, QUANTITY, AND VALUE, 1927

Fur and fur-lined coats and over-coats:		Fur robes:	
Men's—		Number.....	5,461
Number.....	47,424	Value.....	\$790,493
Value.....	\$3,869,238	Fur trimmings, value.....	\$87,817,030
Women's—		Other fur and fur-lined goods, value.....	\$5,918,479
Number.....	1,658,043	Sheep-lined garments:	
Value.....	\$156,851,144	Number.....	916,306
Fur neck pieces:		Value.....	\$5,380,191
Number.....	332,441	Other products, value.....	\$2,503,031
Value.....	\$14,112,848	Custom work and repairing, value.....	\$20,037,409
Fur hats and caps:		Receipts for contract work.....	\$2,069,936
Number.....	39,730	TOTAL VALUE.....	\$299,615,047
Value.....	\$265,228		

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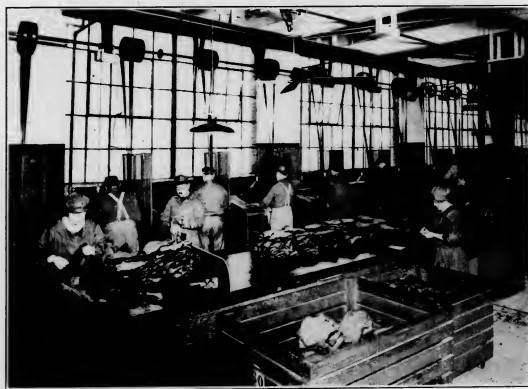


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Value	\$265,228		

The fur trade feels that it renders an important social service in adding to the beauty and comfort of life by transforming a by-product of agriculture, the skins of both wild and domestic animals, into fur garments. The control of some of the smaller fur bearers is essential to the farmer because their very fecundity enables them not only to survive as species under the most persistent trapping, but without such control they would increase to inordinate numbers. Indeed, if furs as wearing apparel were unpopular and their use were to decline materially, much of the good work of the Audubon societies and similar organizations interested in the protection of bird life would be undone in a very few years, and the loss the farmers would suffer could only be estimated.

## DESCRIPTION OF THE UNITED STATES GOVERNMENT'S EXHIBIT

By JOSEPH W. HISCOX, Chief, Office of Exhibits, Extension Service  
U. S. Department of Agriculture

THE SIZE and importance of the fur industry of the United States is shown in the center feature of its exhibit at the International Fur Exposition at Leipzig, Germany. The industry is represented by a scene that shows in the foreground the trapper, the hunter, and the bundles of furs being transported by dog sled, by airplane, and by boat. In the distance are the skyscrapers representing the manufacturing and wholesale branches of the industry. From radio towers a message moves across the sky giving current interesting facts and news of the fur industry. This scene rests on what appears to be a large slab of granite bearing the title "Our Fur Industry is Built on a Firm Foundation," and this slab of granite is in turn supported by three massive stones representing conservation, production, and utilization, the three principles that contribute to the stability of the industry. At the left data are presented regarding the imports, exports, and total production of furs, and on the right are shown our principal fur animals and some facts and figures on the more important ones.

To emphasize the huge production in this country there is a large clock bearing the message that every time the pendulum swings, 2 pelts are taken, 4 pelts are imported, 1 pelt is exported, and \$16 worth of furs are sold at retail in the United States of America. The quality of the furs of the United States may be determined by examination of the durability scale, which shows on a percentage basis the relative durability of all furs.

### FUR FARMING

Miniature fox, mink, raccoon, and rabbit farms built to scale are included in the display. The plan of the farm and the location of the pens, kennels, and buildings illustrate the method of raising these fur animals in captivity. One can obtain considerable information from inspecting these models and reading the legends, which give basic facts concerning methods of management.

## HABITAT GROUPS

The most important fur animals are shown mounted in characteristic poses in their natural habitats. Painted backgrounds and carefully modeled foregrounds depict late fall and winter scenes and make the groups realistic. There are six groups, comprising beavers, muskrats, otters, minks, weasels, fishers, martens, raccoons, wolverenes, foxes, skunks, opossums, and fur seals. The seal group also contains eight beautiful specimens. Some of the predatory animals that prey upon the livestock and game of the range country in the United States also are shown as mounted groups.

## PROTECTING THE FUR SEAL

How the fur seal was saved from extinction by international cooperation is shown in an exhibit that emphasizes by means of a lighted glass chart how the number of seals declined rapidly until protection by international agreement was obtained, after which the numbers showed a marked increase, with the promise of a return to the earlier conditions of abundance. A picture of the signing of the agreement occupies the center of this exhibit. On the left is depicted the destructive type of pelagic sealing before the agreement, and on the right the seals under protection of the Government of the United States.

## PELTS OF FUR ANIMALS

Fine specimens of raw and dressed pelts taken from the principal fur animals of the United States are included in the exhibit. The various processes necessary to transform muskrat fur into Hudson seal and rabbit fur into near seal, sealine, and what you will, are shown by the actual pelts in the various stages of processing. The methods of dressing and dyeing Alaskan seals also is demonstrated in a similar manner.

## FUR TRADE DEVELOPMENTS IN THE UNITED STATES

A number of oil paintings illustrate important developments in fur-trade history, from the time the white man first set foot upon the North American Continent to the present day. Supplementing these paintings is a collection of the weapons used by trappers typical of the various stages of development in the fur trade.

## LANTERN SLIDES AND TRANSPARENCIES

Series of colored lantern slides illustrating the fur animals of the United States and their distribution and the various phases of fur farming, including rabbit raising, form part of the United States Government contribution. A collection of transparencies also has been prepared, to show typical views of the fur-seal industry and blue-fox production industry on the Pribilof Islands.

## MOTION PICTURES

A 3-reel motion picture entitled "The Fur Industry of the United States" was made especially for the International Fur Exposition. It depicts all phases of the fur industry, beginning with trapping the animals in the wild and concluding with technicolor pictures showing manikins wearing the latest styles of fur garments. Other motion pictures, entitled "How to Handle Foxes" and "The Muskrat Industry in Maryland," may be seen in an auditorium, especially constructed for this purpose, during the whole period of the exposition.

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**END OF  
TITLE**